

4.4.15-1 INTRODUCTION

This chapter assesses the potential long-term impacts on ambient air quality due to operation of the Project. Potential short-term air quality impacts from construction of the Project are discussed in Chapter 4.5, "Construction Effects."

The Project would result in a new rail crossing over the Genesee River to replace the existing Portageville Bridge. The Project would not lead to an increased number of trains over the bridge, but would allow for increased speeds and trains with larger loads compared to the existing condition. No changes to the length of trains or the number of trains are proposed as a result of the Project. Thus, this chapter evaluates the effects on air quality from the increased speed and weight of trains crossing the Genesee River at the new Portageville Bridge. This chapter discusses the regulatory context for air quality analysis, presents a discussion of the existing air quality conditions in the study area, and describes the potential operational impacts of the Project.

There is the potential for an increase in the number of trains on the Southern Tier route, independent of the Project. A discussion of the longer-term effects that may occur in the future if the number of trains on the bridge increases independent of the Portageville Bridge Project is provided in Chapter 4.7, "Cumulative Effects." In addition, a discussion of the potential adverse effects on air quality that would be avoided by the Project by avoiding a shutdown of the Southern Tier route is provided in Chapter 4.6, "Indirect (Secondary) Effects."

4.4.15-2 POLLUTANTS FOR ANALYSIS

Ambient air quality is affected by air pollutants produced by both motor vehicles (including trains) and stationary sources. Emissions from motor vehicles are referred to as mobile source emissions, while emissions from fixed facilities are referred to as stationary source emissions. Ambient concentrations of carbon monoxide (CO) are predominantly influenced by mobile source emissions. Particulate matter (PM), volatile organic compounds (VOCs), and nitrogen oxides (nitric oxide, NO, and nitrogen dioxide, NO₂, collectively referred to as NO_x) are emitted from both mobile and stationary sources. Fine PM is also formed when emissions of NO_x, sulfur oxides (SO_x), ammonia, organic compounds, and other gases react or condense in the atmosphere. Emissions of sulfur dioxide (SO₂) are associated mainly with stationary sources and large international marine engines. On-road diesel vehicles currently contribute very little to SO₂ emissions since the sulfur content of on-road diesel fuel, which is federally regulated, is extremely low. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOCs.

4.4.15-2-1 Carbon Monoxide (CO)

CO, a colorless and odorless gas, is produced in the urban environment primarily by the incomplete combustion of gasoline and other fossil fuels. In urban areas, approximately 80 to 90 percent of CO emissions are from motor vehicles. Since CO concentrations can diminish greatly over relatively short distances, elevated concentrations are usually limited to locations near

crowded intersections, heavily traveled and congested roadways, parking lots, and garages. Consequently, CO concentrations must be predicted on a local, or microscale, basis.

4.4.15-2-2 Nitrogen Oxides (NO_x), Volatile Organic Compounds (VOCs), and Ozone

NO_x are of principal concern because of their role, together with VOCs, as precursors in the formation of ozone. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow, and occur as the pollutants are transported downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of NO_x and VOC emissions from all sources are therefore generally examined on a regional basis. The contribution of any action or project to regional emissions of these pollutants would include any added stationary or mobile source emissions; the change in regional emissions of these pollutants would be related to the total miles traveled added or subtracted throughout the area.

In addition to being a precursor to the formation of ozone, NO₂ (one component of NO_x) is also a regulated pollutant. Since NO₂ is mostly formed from the transformation of NO in the atmosphere, it has mostly been of concern further downwind from large stationary point sources, and not a local concern from mobile sources (NO_x emissions from fuel combustion consist of approximately 90 percent NO and 10 percent NO₂ at the source). However, with the promulgation of the 2010 1-hour average standard for NO₂, local sources such as vehicular emissions may become of greater concern for this pollutant.

4.4.15-2-3 Lead

Airborne lead emissions are currently associated principally with industrial sources. Effective January 1, 1996, the Clean Air Act (CAA) banned the sale of the small amount of leaded fuel that was still available in some parts of the country for use in on-road vehicles, concluding a 25-year effort to phase out lead in gasoline. Even at locations where traffic volumes are very high, atmospheric lead concentrations are far below the 3-month average national standard of 0.15 micrograms per cubic meter (µg/m³).

4.4.15-2-4 Respirable Particulate Matter (PM₁₀ and PM_{2.5})

PM is a broad class of air pollutants that includes discrete particles of a wide range of sizes and chemical compositions, as either liquid droplets (aerosols) or solids suspended in the atmosphere. The constituents of PM are both numerous and varied, and they are emitted from a wide variety of sources (both natural and human-induced). Natural sources include condensed and reacted forms of naturally occurring VOC; salt particles resulting from the evaporation of sea spray; wind-borne pollen, fungi, molds, algae, yeasts, rusts, bacteria, and material from live and decaying plant and animal life; particles eroded from beaches, soil, and rock; and particles emitted from volcanic and geothermal eruptions and from forest fires. Naturally occurring PM is generally greater than 2.5 micrometers in diameter. Major human-induced sources include the combustion of fossil fuels (e.g., vehicular exhaust, power generation, boilers, engines, and home heating), chemical and manufacturing processes, all types of construction, agricultural activities, as well as wood-burning stoves and fireplaces. PM also acts as a substrate for the adsorption (accumulation of gases, liquids, or solutes on the surface of a solid or liquid) of other pollutants, often toxic and some likely carcinogenic compounds.

PM is regulated in two size categories: particles with an aerodynamic diameter of less than or equal to 2.5 micrometers (PM_{2.5}), and particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM₁₀, which includes PM_{2.5}). PM_{2.5} has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds that adsorb to the surfaces of the particles, and is also extremely persistent in the atmosphere. PM_{2.5} is mainly derived from

combustion material that has volatilized and then condensed to form primary PM (often soon after the release from a source exhaust) or from precursor gases reacting in the atmosphere to form secondary PM.

4.4.15-2-5 Sulfur Dioxide (SO₂)

SO₂ emissions are primarily associated with the combustion of sulfur-containing fuels (oil and coal). SO₂ is also of concern as a precursor to PM_{2.5} and is regulated as a PM_{2.5} precursor under the New Source Review permitting program for large sources. Monitored SO₂ concentrations in New York State are lower than the current national standards. Due to the federal restrictions on the sulfur content in diesel fuel for on-road vehicles, no substantial quantities are emitted from vehicular sources.

4.4.15-3 REGULATORY FRAMEWORK

4.4.15-3-1 National and State Ambient Air Quality Standards

As required by the CAA, primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: CO, NO₂, ozone, PM (both PM_{2.5} and PM₁₀), SO₂, and lead. The primary standards represent levels deemed appropriate to protect the public health, allowing an adequate margin of safety. The secondary standards are intended to protect the nation's welfare, and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. The primary standards are generally either the same as the secondary standards or more restrictive. The NAAQS are presented in **Table 4.4.15-1**. The NAAQS for CO, annual NO₂, and SO₂ have also been adopted as the ambient air quality standards for New York State, but are defined on a running 12-month basis rather than for calendar years only. New York State also has standards for total suspended particulate matter (TSP), settleable particles, non-methane hydrocarbons (NMHC), and ozone which correspond to federal standards that have since been revoked or replaced, and for beryllium, fluoride, and hydrogen sulfide (H₂S).

The U.S. Environmental Protection Agency (USEPA) revised the NAAQS for PM, effective December 18, 2006. The revision included lowering the level of the 24-hour PM_{2.5} standard from 65 µg/m³ to 35 µg/m³ and retaining the level of the annual standard at 15 µg/m³. The PM₁₀ 24-hour average standard was retained and the annual average PM₁₀ standard was revoked. USEPA recently lowered the primary annual PM_{2.5} average standard from 15 µg/m³ to 12 µg/m³, effective March 2013.

USEPA also revised the 8-hour ozone standard, lowering it from 0.08 to 0.075 parts per million (ppm), effective as of May 2008. On January 6, 2010, USEPA proposed a change in the 2008 ozone NAAQS, lowering the primary NAAQS from the current 0.075 ppm level to within the range of 0.060 to 0.070 ppm. USEPA is also proposing a secondary ozone standard, measured as a cumulative concentration within the range of 7 to 15 ppm-hours aimed mainly at protecting sensitive vegetation. A final decision on this standard has been postponed and is currently in review.

USEPA lowered the primary and secondary standards for lead to 0.15 µg/m³, effective January 12, 2009. USEPA revised the averaging time to a rolling 3-month average and the form of the standard to not-to-exceed values across a 3-year span.

USEPA established a new 1-hour average NO₂ standard of 0.100 ppm, effective April 12, 2010, in addition to the annual standard. The statistical form is the 3-year average of the 98th percentile of daily maximum 1-hour average concentration in a year.

**Table 4.4.15-2
National Ambient Air Quality Standards (NAAQS)**

Pollutant	Primary		Secondary	
	ppm	µg/m ³	ppm	µg/m ³
Carbon Monoxide (CO)				
8-Hour Average ⁽¹⁾	9	10,000	None	
1-Hour Average ⁽¹⁾	35	40,000		
Lead				
Rolling 3-Month Average ⁽²⁾	NA	0.15	NA	0.15
Nitrogen Dioxide (NO ₂)				
1-Hour Average ⁽³⁾	0.100	188	None	
Annual Average	0.053	100	0.053	100
Ozone (O ₃)				
8-Hour Average ^(4,5)	0.075	150	0.075	150
Respirable Particulate Matter (PM ₁₀)				
24-Hour Average ⁽¹⁾	NA	150	NA	150
Fine Respirable Particulate Matter (PM _{2.5})				
Annual Mean ⁽⁶⁾	NA	12	NA	15
24-Hour Average ⁽⁷⁾	NA	35	NA	35
Sulfur Dioxide (SO ₂) ⁽⁸⁾				
1-Hour Average ⁽⁹⁾	0.075	196	NA	NA
Maximum 3-Hour Average ⁽¹⁾	NA	NA	0.50	1,300
Notes: ppm – parts per million (unit of measure for gases only) µg/m ³ – micrograms per cubic meter (unit of measure for gases and particles, including lead) NA – not applicable All annual periods refer to calendar year. Standards are defined in ppm and approximately equivalent concentrations in µg/m ³ are presented. ⁽¹⁾ Not to be exceeded more than once a year. ⁽²⁾ USEPA has lowered the NAAQS down from 1.5 µg/m ³ , effective January 12, 2009. ⁽³⁾ 3-year average of the annual 98th percentile daily maximum 1-hr average concentration. Effective April 12, 2010. ⁽⁴⁾ 3-year average of the annual fourth highest daily maximum 8-hr average concentration. ⁽⁵⁾ USEPA has proposed lowering this standard further to within the range 0.060-0.070 ppm, and adding a secondary standard measured as a cumulative concentration within the range of 7 to 15 ppm-hours aimed mainly at protecting sensitive vegetation. A final decision on this standard has been postponed band is currently in review. ⁽⁶⁾ 3-year average of annual mean. USEPA has lowered the primary standard from 15 µg/m ³ , effective March 2013. ⁽⁷⁾ Not to be exceeded by the annual 98th percentile when averaged over 3 years. ⁽⁸⁾ USEPA revoked the 24-hour and annual primary standards, replacing them with a 1-hour average standard. Effective August 23, 2010. ⁽⁹⁾ 3-year average of the annual 98th percentile daily maximum 1-hr average concentration. Source: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.				

USEPA established a new 1-hour average SO₂ standard of 0.075 ppm, replacing the current 24-hour and annual primary standards, effective August 23, 2010. The statistical form is the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour concentrations (the 4th highest daily maximum corresponds approximately to 99th percentile for a year.)

4.4.15-3-2 NAAQS Attainment Status and State Implementation Plans (SIPs)

The CAA, as amended in 1990, defines non-attainment areas (NAA) as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated as non-attainment by USEPA, the state is required to develop and implement a State Implementation Plan (SIP), which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the CAA, followed by a plan for maintaining attainment status once the area is in attainment.

In 1997, USEPA promulgated an 8-hour NAAQS for ozone, replacing the 1-hour NAAQS. Livingston County is part of the Rochester area currently classified as a non-attainment area under the 1997 8-hour ozone NAAQS. While this standard has been revoked for transportation conformity purposes, this classification remains in effect for general conformity and other purposes (see information about conformity in the following section). Wyoming County is currently in attainment for this standard. In March 2008, USEPA strengthened the 8-hour ozone standards and recently proposed additional reductions in NAAQS levels to strengthen the standard. SIPs will be due three years after the final designations are made. In April 2012, USEPA designated the Rochester metropolitan area (which includes Livingston County) as in attainment for the 2008 ozone standard.

Wyoming and Livingston Counties are currently in attainment of the annual-average NO₂ standard. USEPA has designated the entire state of New York as “unclassifiable/attainment” of the new 1-hour NO₂ standard effective February 29, 2012. Since additional monitoring is required for the 1-hour standard, areas will be reclassified once three years of monitoring data are available (2016 or 2017).

USEPA has established a new 1-hour SO₂ standard, replacing the 24-hour and annual standards, effective August 23, 2010. Based on the available monitoring data, all New York State counties currently meet the 1-hour standard, but additional monitoring will be required. Draft attainment designations were published by USEPA in February 2013, indicating that USEPA is deferring action to designate areas in New York State and expects to proceed with designations once additional data are gathered.

4.4.15-3-3 Conformity with State Implementation Plans

The conformity requirements of the CAA and regulations promulgated thereunder (conformity requirements) limit the ability of federal agencies to assist, fund, permit, and approve projects in NAAs or maintenance areas that do not conform to the applicable SIP. Conformity is regulated under two categories—Transportation Conformity and General Conformity. Transportation conformity only applies to projects approved, funded, or implemented by the Federal Highway Administration (FHWA) and/or the Federal Transit Administration (FTA); conformity for all other federally assisted, funded, permitted, and approved projects must be analyzed according to the general conformity regulations (40 CFR Part 93 Subpart B). Because the Portageville Bridge Project is partially located in Livingston County and would require approvals from federal agencies (the U.S. Army Corps of Engineers and the National Park Service), the general conformity requirements apply.

Changes in emissions during operation of the Project could occur as a result in changes in speed of trains on the discrete section of the rail route crossing the bridge, and as a result of increased load. As described in detail in Chapter 4.4.16, “Energy and Greenhouse Gases,”

increased speed on the bridge would result in lower locomotive emissions, and any increase in emissions due to increased loads would be minimal. Therefore, pollutant emissions would not increase as a result of the Project's operation. Furthermore, the Genesee Transportation Council—the metropolitan planning organization for the region, responsible for transportation planning and its conformity with state air quality implementation plans—has added the Project to the 2014–2017 Transportation Improvement Plan.¹

The construction of the Project would result in some emissions from on-site construction equipment and the transport of construction materials. Construction equipment (non-road) emissions associated with projects are not generally considered to be incremental in reference to annual construction emissions in any given nonattainment area, which would be included in state implementation plans, because specific construction projects do not represent growth in the industry unless they are long-term (more than five years), very large, regionally significant projects that result in growth in the construction industry in the area. Given their temporary nature, construction emissions in the state implementation plans are projected into the future based on projected activity in the construction industry in the area, including any projected growth, and not based on specific known projects or sources. Therefore, the Project may be presumed to conform to the SIP, and a general conformity determination is not required.

The transportation conformity requirements do not apply to projects in Livingston and Wyoming Counties. Note that there is no ozone state implementation plan for the Rochester nonattainment area, and the area is not in a non-attainment area for the purposes of transportation conformity.

4.4.15-4 METHODOLOGY

4.4.15-4-1 Carbon Monoxide (CO) Microscale Analysis

An air quality analysis for CO is not required since the Project would not increase vehicle or locomotive traffic volumes, reduce source-receptor distances, or change other existing conditions to such a degree as to affect attainment of the CO NAAQS.

4.4.15-4-2 Mesoscale Analysis

A mesoscale air quality analysis is not required for this Project since it would not increase vehicle or locomotive traffic volumes and therefore would not affect emissions on a regional basis.

4.4.15-4-3 Toxic Air Contaminants

The need for an analysis of toxic air contaminants (TAC), also referred to as mobile source air toxics (MSAT) when emitted from mobile sources, was evaluated using the guidance found in *FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents, September 2009*. Based on the FHWA guidance, a MSAT analysis is not required for this type of Project. The Project would not result in any meaningful changes in traffic volumes, vehicle mix, or any other factor that would cause an increase in emissions impacts relative to the no action scenario. In terms of rail emissions, as described in Section 4.4.15-4 of this chapter, since no substantial increase in emissions or concentrations would be expected, detailed analysis of TAC emissions is not necessary.

¹ Richard Perrin, Executive Director GTC, *Memorandum: Proposed Council Resolutions 13-155 through 13-197*, November 6, 2013, http://www.gtcmpo.org/GetInvolved/Meetings/2013/PC/November/ActionItem_B.pdf.

4.4.15-4-4 Particulate Matter (PM) Analysis

Diesel-powered locomotives operate over the Portageville Bridge, and diesel locomotives generate PM. However, the Project would not increase the number of train trips per day as compared to existing conditions. In addition, the Project would not increase vehicle traffic volumes. Since the Project would not result in a measurable increase in PM, detailed analysis is not necessary and it can be concluded that the Project will have no substantial adverse impact on ambient PM levels.

4.4.15-4-5 Greenhouse Gas Analysis

See Chapter 4.4.16, "Energy and Greenhouse Gases."

4.4.15-5 EXISTING CONDITIONS

Monitored background data were used to determine current background concentrations. Monitored ambient pollutant concentrations of CO, SO₂, PM₁₀, PM_{2.5}, NO₂, lead, and ozone for the Project area are shown in **Table 4.4.15-2** for 2011. These values are the most recent monitored data made available by NYSDEC for nearby monitoring stations. There were no monitored violations of the NAAQS for the pollutants at these sites in 2011.

**Table 4.4.15-2
Representative Monitored Ambient Air Quality Data
(Rochester Station, 2701-22)**

Pollutants (units)	Period	Concentrations			Number of Times Federal Standard Exceeded	
		Mean	Highest	Second Highest	Primary	Secondary
CO (ppm)	8-hour	-	0.9	0.7	0	-
	1-hour	-	1.3	1.1	0	-
SO ₂ (ppm)	Annual	0.001	-	-	0	-
	24-hour	-	0.008	0.005	0	-
	3-hour	-	0.016	0.015	-	0
PM ₁₀ (µg/m ³)	Annual	13	-	-	0	0
	24-hour	-	27	26	0	0
PM _{2.5} (µg/m ³)	Annual	8.6	-	-	0	-
	24-hour	-	28.6	24.4	0	-
NO ₂ (ppm) *	1-hour	-	0.058	0.053	0	-
	Annual**	0.008	-	-	0	0
Lead (PM ₁₀ , µg/m ³)	3-month	0.003	-	-	0	-
Ozone (ppm)	8-hour***	-	0.075	-	0	0
	1-hour	-	0.104	0.087	0	0
Source: 2012 Annual New York State Air Quality Data Tables, NYSDEC. Notes: * Based on 2011 data. No other data is available. ** Based on insufficient data. *** 4th highest daily maximum						

4.4.15-6 EFFECTS ASSESSMENT

4.4.15-6-1 No Action Alternative

Independent of the Project, air quality in the region should continue to improve due to the effect of federally mandated emission control programs to be implemented over the next several years.

Many of these programs were part of the CAA or are included as part of each state's SIP to meet the NAAQS. These programs cover a wide range of sources, both mobile and stationary sources, and will affect emissions of NO_x, SO₂, CO, PM, and VOCs.

Under the No Action Alternative, this DEIS assumes that the existing bridge would remain in place and rail freight operations would continue on the bridge. Air quality would be similar to existing conditions; however, the Project purpose and need would not be met. As compared to the Preferred Alternative, there would be increased fuel demand due to speed restrictions and necessary bridge maintenance, likely resulting in greater emissions from locomotives. Moreover, if the existing bridge cannot remain in service, freight operations would be shifted to other rail routes and also to other modes, and particularly to trucks. This would result in an increase in emissions, as discussed in Chapter 4.6, "Indirect (Secondary) Effects."

4.4.15-6-2 Preferred Alternative

The Preferred Alternative would not result in an increase in the number of train trips on the Southern Tier route, but it would allow for an increase in speeds (up to 35 MPH) as compared to the existing condition (10 MPH). Without the speed and weight limitations, it is expected that trains would operate more efficiently, without the need to decelerate and accelerate as they approach and depart the bridge. With a new bridge, trains could potentially carry heavier loads, which could accommodate freight operations that may now be undertaken by truck and may avoid additional trips that are now necessary because the standard weight car cannot be used along the Southern Tier route.

In turn, the Preferred Alternative would reduce fuel usage and likely result in lower emissions from locomotives. No adverse air quality impacts are predicted.

4.4.15-7 SUMMARY OF MITIGATION

The Project would not result in adverse impacts on air quality. Therefore, mitigation is not required.